

What is claimed is:

1. A clutch for transmission power formed with a flywheel, a clutch cover and a clutch disk assembly positioning between said flywheel and said clutch cover,
5 wherein said clutch disk assembly comprises:

a clutch facing having main body portion formed with a center hole in the middle thereof, and a contacting portion wherein one side thereof faces the friction pad at said flywheel side and the other side thereof faces the press plate of said clutch cover, and the portion facing each other between said friction pad and said press
10 plate is made of carbon-carbon composition;

a spline hub being overlapped with one side of said clutch facing wherein a spline groove is formed inside the inner diameter thereof; and

a combining means for combining said clutch facing with said spline hub.

15 2. The clutch for transmission power of claim 1, wherein said spline hub is formed with a boss for inserting into said center hole of said clutch facing.

3. The clutch for transmission power of claim 1, wherein said combining means comprises:

20 a retainer ring being overlapped with the other side of said clutch facing; and

a fastening member for combining by passing through said clutch facing, said spline hub and said retainer ring together.

4. The clutch for transmission power of claim 3, wherein said fastening
25 member includes either bolt or rivet.

5. The clutch for transmission power of claim 1, wherein said contacting portion is formed with carbon-carbon composition which is composed of 20~75 weight % of carbon fiber and 25~80 weight % of pitch.

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6. The clutch for transmission power of claim 5, wherein said carbon fiber is a single fiber.

7. The clutch for transmission power of claim 5, wherein said carbon fiber is formed by stacking continuously woven carbon fabrics.

5 8. The clutch for transmission power of claim 1, wherein said contacting portion is formed with carbon-silicon carbide which is composed of 3~20 weight % of silicon, 10~60 weight % of silicon carbide, and 20~87 weight % of pitch-containing carbon.

10 9. The clutch for transmission power of claim 8, wherein said carbon fiber is a single fiber.

10. The clutch for transmission power of claim 8, wherein said carbon fiber is formed by stacking continuously woven carbon fabrics.

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11. The clutch for transmission power of claim 1, wherein said body portion is integrally formed with said contacting portion by using the same carbon-carbon composition material which is used for said contacting portion.

20 12. The clutch for transmission power of claim 1, wherein said press plate is provided with the press pad adjoining said clutch facing, and said press pad and said friction pad are formed with the same carbon-carbon composition which is used for said contacting portion.

25 13. A method of manufacturing the friction substance for a clutch comprising the steps of:

performing a first thermal treatment wherein carbon fiber is thermally treated for graphitization at a first thermal processing temperature;

30 producing a prepreg wherein resin is sprayed on carbon fiber fabrics for forming the prepreg;

producing a preform wherein carbon fiber and resin are stacked on said prepreg for forming the preform;

producing a mold wherein the mold is formed by using a press on said preform; and

performing a second thermal treatment wherein said mold is thermally treated at a second thermal processing temperature.

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14. The method of manufacturing the friction substance for the clutch of claim 13, further comprising the step of cutting said thermally treated carbon fiber at the length of 200~2,000 μm by using fiber-cutting machine between the first thermal treatment process and the prepreg producing process.

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15. The method of manufacturing the friction substance for the clutch of claim 14, further comprising a densification process for densifying said mold at a predetermined density using a carbonization/impregnation process for pressurizing at the carbonizing pressure of 50~2,000 kg/cm^2 within the range of 750~1,400 $^{\circ}\text{C}$ for 3~5 hours between said mold producing process and said second thermal treatment process.

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16. The method of manufacturing the friction substance for the clutch of claim 15, wherein said predetermined density is 1.3~1.6 g/cm^3 .

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17. The method of manufacturing the friction substance for the clutch of claim 13, wherein said first thermal processing temperature is 2,000~3,000 $^{\circ}\text{C}$ during the first thermal treatment process.

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18. The method of manufacturing the friction substance for the clutch of claim 13, said mold is composed of 20~75 weight % of carbon fiber and 25~80 weight % of said resin, and molded through heating within the range of 200~300 $^{\circ}\text{C}$ in a press.

19. The method of manufacturing the friction substance for the clutch of claim 13, wherein said second thermal treatment process is performed at the maximum temperature for 3~5 hours under second thermal processing temperature of 1,700~2,500 $^{\circ}\text{C}$, vacuum level of 3~5 mmHg, and heat rising rate of 20~100 $^{\circ}\text{C}/\text{hr}$.

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20. The method of manufacturing the friction substance for the clutch of claim 13 further comprising the steps of:

performing a silicon powder addition process for adding silicon powder to said mold after said second thermal treatment process; and

performing a vacuum heating process for increasing the temperature within the range of 1,450°C~2,200°C and maintaining it for 0.1~5.0 hours under vacuum atmosphere.

21. The method of manufacturing the friction substance for the clutch of claim 20, wherein said silicon powder 0.2~5.0 times heavier than said mold in weight ratio is added during said silicon powder addition process.

22. The method of manufacturing the friction substance for the clutch of claim 20, wherein said mold is composed of 3~25 weight % of silicon, 10~65 weight % of silicon carbide, and 10~80 weight % of carbon after finishing the vacuum heating process.

23. The method of manufacturing the friction substance for the clutch of claim 13, wherein said mold is used for any one of clutch facing, friction pad, and press pad on which friction is made in the clutch.

24. The method of manufacturing the friction substance for the clutch comprising the steps of:

heating for creating thermal gradient between the inside and outside of said preform by mounting a heating element on a three-dimensional preform;

infiltrating reaction gas containing 1~6 carbons per molecule inside said reactor;

producing a mold by performing reaction under a predetermined condition; and

performing a thermal treatment on said mold.

25. The method of manufacturing the friction substance for the clutch of claim 24, wherein said predetermined condition is heat rising rate of 10~20 °C/min, reaction temperature of 700~1200 °C, reaction gas concentration of 10~100%, and reaction pressure of 250~1,500 mbar.

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26. The method of manufacturing the friction substance for the clutch of claim 24, wherein said thermal treatment process is performed at the maximum temperature for 3~5 hours under second thermal processing temperature of 1,700~2,500 °C, vacuum level of 3~5 mmHg, and heat rising rate of 20~100 °C/hr.,

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27. The method of manufacturing the friction substance for the clutch of claim 24, wherein said mold is used for any one of clutch facing, friction pad, and press pad on which friction is made in the clutch.

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